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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2013/2014**

COURSE NAME : WORKSHOP TECHNOLOGY
COURSE CODE : BBM 10203
PROGRAMME : 1 BDD
EXAMINATION DATE : DECEMBER 2013/JANUARY 2014
DURATION : 3 HOURS
INSTRUCTION : A) ANSWER **ALL** QUESTIONS
IN SECTION A
B) ANSWER **TWO(2)**
QUESTIONS ONLY IN
SECTION B

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

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SECTION A

Q1 Figure Q1 shows a template plate produced from a piece of mild steel plate.

- (a) Explain the safety precautions to be taken before the plate production process above.
(5 marks)
- (b) In order to make sure that marking and measuring process are accurate and precise, measuring tools should be handled with care. Describe the steps that should be taken to ensure that the measuring equipment is always in good condition.
(8 marks)
- (c) Using a sketches, describe the steps to mark the plate and specify the equipment used.
(12 marks)

Q2 (a) A screw has specifications of M10 x 1.5. Explain what M10 x 1.5 represented.
(5 marks)

- (b) A hole is being drilled into a block of magnesium alloy with a 10mm drill bit at feed of 0.02cm/rev and spindle running at $N = 800$ rpm. Calculate the material removal rate and the torque on the drill.
(8 marks)
- (c) Grinding machine is used to remove unwanted metal where it is applicable to almost all types of materials. Explain the concept of this machine work with the sketch and example.
(12 marks)

SECTION B

Q3 (a) Why are the blades tensions of power hacksaw important?
(5 marks)

- (b) The mechanical properties of steel in its normal state depend upon the carbon content. Sketch the graph showing how strength, hardness and ductility change with the carbon content and state one use for each of low carbon steel, medium carbon steel and high carbon steel.
(8 marks)

- (c) Blast furnace is the most common type of furnace used in iron production. Describe briefly the process of iron production using this furnace.
(12 marks)

Q4 (a) A machining operation is being carried out with a cutting fluid that is an effective lubricant. What will be changes in the mechanics of cutting operation if the fluid is shut off?
(5 marks)

(b) Selection of cutting fluids are dependent on the characteristics of cutting fluids and its applications. Briefly describe the **four (4)** types of cutting fluids are commonly used in machining operations.
(8 marks)

(c) Shielded metal-arc welding (SMAW) is one of the oldest, simplest and most versatile joining process. Explain with an illustration the basic principle of shielded metal-arc welding.
(12 marks)

Q5 (a) Describe briefly the concept of Phase Diagram.
(3 marks)

(b) The computer and consumer electronics industries place extremely high demands on electronic components. Integrated circuits and other electronic devices are expected to function reliably for extended periods, during which they may be subjected to significant temperature variations and vibration. There are a number of problems identified during a soldering process. Based on the problems below, identify the potential reason and solution

(i) Solder melts into a ball but doesn't flow.
(3 marks)

(ii) Solder only cover one side
(3 marks)

(iii) The circuit copper melts before the solder.
(3 marks)

(c) Explain clearly the difference between annealing and tempering in terms of function, process, and change in the mechanical properties.
(13marks)

-SOALAN TAMAT-

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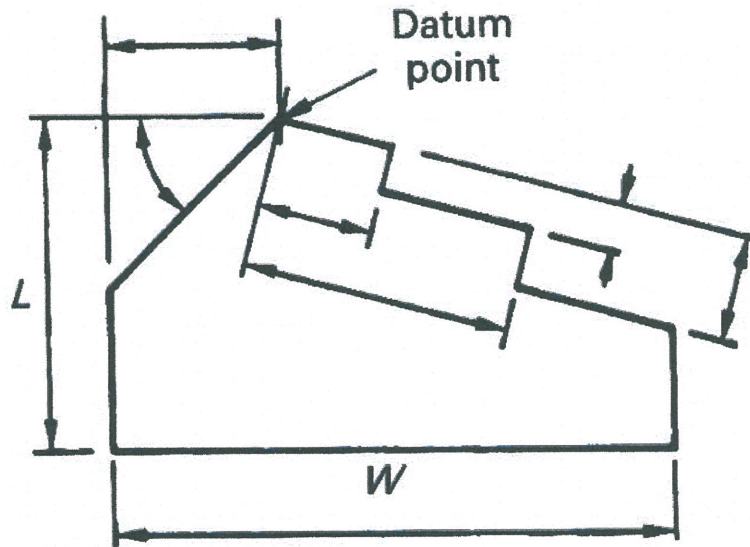


FIGURE Q1